

### Claims

1. A method for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL in a sample, the method comprising determining the expression level of markers selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1 and/or 2,

wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.1 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.1 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.2 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.2 having a positive fc value,

is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.3 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.3 having a positive fc value,

is indicative for the presence ALL\_T lineage when ALL\_T lineage is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.4 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.4 having a positive fc value,

5 is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14) is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.5 having a negative fc value, and/or

10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.5 having a positive fc value,

is indicative for the presence AML\_MLL when AML\_MLL is distinguished from all other subtypes,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.6 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.6 having a positive fc value,

20 is indicative for the presence AML\_inv(16) when AML\_inv(16) is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.7 having a negative fc value, and/or

25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.7 having a positive fc value,

is indicative for the presence AML\_inv(3) when AML\_inv(3) is distinguished from all other subtypes,

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.8 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.8 having a positive fc value,

is indicative for the presence AML\_komplex when AML\_komplex is distinguished from all other subtypes,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.9 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.9 having a positive fc value,

10 is indicative for the presence AML\_t(15;17) when AML\_t(15;17) is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.10 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.10 having a positive fc value,

is indicative for the presence AML\_t(8;21) when AML\_t(8;21) is distinguished from all other subtypes,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.11 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.11 having a positive fc value,

25 is indicative for the presence CLL when CLL is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.12 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.12 having a positive fc value,

is indicative for the presence CML when CML is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.13 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.13 having a positive fc value,

is indicative for the presence normal-BM when normal-BM is distinguished from all leukemia subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.1 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.1 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from ALL\_Ph+,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.2 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.2 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from ALL\_T lineage,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.3 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.3 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from ALL\_t(8;14),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.4 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.4 having a positive fc value,

5 is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from AML\_MLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.5 having a negative fc value, and/or

10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.5 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from AML\_inv(16),

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.6 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.6 having a positive fc value,

20 is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from AML\_inv(3),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.7 having a negative fc value, and/or

25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.7 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from AML\_komplext,

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.8 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.8 having a positive fc value,  
is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from AML\_t(15;17),

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.9 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.9 having a positive fc value,  
10 is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from AML\_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.10 having a negative fc value, and/or  
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.10 having a positive fc value,  
is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from CLL,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.11 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.11 having a positive fc value,  
is indicative for the presence ALL\_MLL when ALL\_MLL is  
25 distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.12 having a negative fc value, and/or  
30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.12 having a positive fc value,

is indicative for the presence ALL\_MLL when ALL\_MLL is distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.13 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.13 having a positive fc value,

is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from ALL\_T lineage,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.14 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.14 having a positive fc value,

is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from ALL\_t(8;14),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.15 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.15 having a positive fc value,

is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from AML\_MLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.16 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.16 having a positive fc value,

is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from AML\_inv(16),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.17 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.17 having a positive fc value,  
5 is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from AML\_inv(3),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.18 having a negative fc value, and/or  
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.18 having a positive fc value,  
is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from AML\_komplext,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.19 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.19 having a positive fc value,  
is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is  
20 distinguished from AML\_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.20 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least  
25 one of the numbers 1 to 50 of Table 2.20 having a positive fc value,  
is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from AML\_t(8;21),

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.21 having a negative fc value, and/or



a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.21 having a positive fc value,  
is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from CLL,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.22 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.22 having a positive fc value,  
10 is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.23 having a negative fc value, and/or  
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.23 having a positive fc value,  
is indicative for the presence ALL\_Ph+ when ALL\_Ph+ is distinguished from normal-BM,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.24 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.24 having a positive fc value,  
is indicative for the presence ALL\_T lineage when ALL\_T lineage  
25 distinguished from ALL\_t(8;14),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.25 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.25 having a positive fc value,  
30

is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from AML\_MLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.26 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.26 having a positive fc value,

is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from AML\_inv(16),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.27 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.27 having a positive fc value,

is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from AML\_inv(3),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.28 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.28 having a positive fc value,

is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from AML\_komplex,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.29 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.29 having a positive fc value,

is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from AML\_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.30 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.30 having a positive fc value, is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from AML\_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.31 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.31 having a positive fc value, is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.32 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.32 having a positive fc value, is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.33 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.33 having a positive fc value, is indicative for the presence ALL\_T lineage when ALL\_T lineage distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.34 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.34 having a positive fc value,  
is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from AML\_MLL,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.35 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.35 having a positive fc value,  
10 is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from AML\_inv(16),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.36 having a negative fc value, and/or  
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.36 having a positive fc value,  
is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from AML\_inv(3),

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.37 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.37 having a positive fc value,  
is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
25 distinguished from AML\_komplex,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.38 having a negative fc value, and/or  
30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.38 having a positive fc value,

is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from AML\_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.39 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.39 having a positive fc value,

is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from AML\_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.40 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.40 having a positive fc value,

is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.41 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.41 having a positive fc value,

is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.42 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.42 having a positive fc value,

is indicative for the presence ALL\_t(8;14) when ALL\_t(8;14)  
distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.43 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.43 having a positive fc value,  
5 is indicative for the presence AML\_MLL when AML\_MLL distinguished from AML\_inv(16),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.44 having a negative fc value, and/or  
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.44 having a positive fc value,  
is indicative for the presence AML\_MLL when AML\_MLL distinguished from AML\_inv(3),

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.45 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.45 having a positive fc value,  
is indicative for the presence AML\_MLL when AML\_MLL distinguished from AML\_komplext,  
20

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.46 having a negative fc value, and/or  
25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.46 having a positive fc value,  
is indicative for the presence AML\_MLL when AML\_MLL distinguished from AML\_t(15;17),

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.47 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.47 having a positive fc value,

is indicative for the presence AML\_MLL when AML\_MLL distinguished from AML\_t(8;21),

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.48 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.48 having a positive fc value,

10 is indicative for the presence AML\_MLL when AML\_MLL distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.49 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.49 having a positive fc value,

is indicative for the presence AML\_MLL when AML\_MLL distinguished from CML,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.50 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.50 having a positive fc value,

25 is indicative for the presence AML\_MLL when AML\_MLL distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.51 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.51 having a positive fc value,

is indicative for the presence AML\_inv(16) when AML\_inv(16)  
distinguished from AML\_inv(3),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.52 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.52 having a positive fc value,

is indicative for the presence AML\_inv(16) when AML\_inv(16)  
distinguished from AML\_komplex, t,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.53 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.53 having a positive fc value,

is indicative for the presence AML\_inv(16) when AML\_inv(16)  
distinguished from AML\_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.54 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.54 having a positive fc value,

is indicative for the presence AML\_inv(16) when AML\_inv(16)  
distinguished from AML\_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
of the numbers 1 to 50 of Table 2.55 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least  
one of the numbers 1 to 50 of Table 2.55 having a positive fc value,

is indicative for the presence AML\_inv(16) when AML\_inv(16)  
distinguished from CLL,

and/or wherein



a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.56 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.56 having a positive fc value,  
5 is indicative for the presence AML\_inv(16) when AML\_inv(16) distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.57 having a negative fc value, and/or  
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.57 having a positive fc value,  
is indicative for the presence AML\_inv(16) when AML\_inv(16) distinguished from normal-BM,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.58 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.58 having a positive fc value,  
is indicative for the presence AML\_inv(3) when AML\_inv(3)  
20 distinguished from AML\_komplext,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.59 having a negative fc value, and/or  
25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.59 having a positive fc value,  
is indicative for the presence AML\_inv(3) when AML\_inv(3) distinguished from AML\_t(15;17),

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.60 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.60 having a positive fc value,  
is indicative for the presence AML\_inv(3) when AML\_inv(3) distinguished from AML\_t(8;21),

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.61 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.61 having a positive fc value,  
10 is indicative for the presence AML\_inv(3) when AML\_inv(3) distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.62 having a negative fc value, and/or  
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.62 having a positive fc value,  
is indicative for the presence AML\_inv(3) when AML\_inv(3) distinguished from CML,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.63 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.63 having a positive fc value,  
is indicative for the presence AML\_inv(3) when AML\_inv(3)  
25 distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.64 having a negative fc value, and/or  
30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.64 having a positive fc value,

is indicative for the presence AML\_komplext when AML\_komplext distinguished from AML\_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.65 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.65 having a positive fc value,

is indicative for the presence AML\_komplext when AML\_komplext distinguished from AML\_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.66 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.66 having a positive fc value,

is indicative for the presence AML\_komplext when AML\_komplext distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.67 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.67 having a positive fc value,

is indicative for the presence AML\_komplext when AML\_komplext distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.68 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.68 having a positive fc value,

is indicative for the presence AML\_komplext when AML\_komplext distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.69 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.69 having a positive fc value,  
5 is indicative for the presence AML\_t(15;17) when AML\_t(15;17) is distinguished from AML\_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.70 having a negative fc value, and/or  
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.70 having a positive fc value,  
is indicative for the presence AML\_t(15;17) when AML\_t(15;17) is distinguished from CLL,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.71 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.71 having a positive fc value,  
is indicative for the presence AML\_t(15;17) when AML\_t(15;17) is  
20 distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.72 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least  
25 one of the numbers 1 to 50 of Table 2.72 having a positive fc value,  
is indicative for the presence AML\_t(15;17) when AML\_t(15;17) is distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one  
30 of the numbers 1 to 50 of Table 2.73 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.73 having a positive fc value,  
is indicative for the presence AML\_t(8;21) when AML\_t(8;21) is distinguished from CLL,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.74 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.74 having a positive fc value,  
10 is indicative for the presence AML\_t(8;21) when AML\_t(8;21) is distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.75 having a negative fc value, and/or  
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.75 having a positive fc value,  
is indicative for the presence AML\_t(8;21) when AML\_t(8;21) is distinguished from normal-BM,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.76 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.76 having a positive fc value,  
is indicative for the presence CLL when CLL is distinguished from  
25 CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.77 having a negative fc value, and/or  
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.77 having a positive fc value,  
30

is indicative for the presence CLL when CLL is distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.78 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.78 having a positive fc value, is indicative for the presence CML when CML is distinguished from normal-BM.

2. The method according to claim 1 wherein the polynucleotide is labelled.
3. The method according to claim 1 or 2, wherein the label is a luminescent, preferably a fluorescent label, an enzymatic or a radioactive label.
4. The method according at least one of the claims 1-3, wherein the expression level of at least two, preferably of at least ten, more preferably of at least 25, most preferably of 50 of the markers of at least one of the Tables 1.1-2.78 is determined.
5. The method according to at least one of the claims 1-4, wherein the expression level of markers expressed lower in a first subtype than in at least one second subtype, which differs from the first subtype, is at least 5 %, 10% or 20%, more preferred at least 50% or may even be 75% or 100%, i.e. 2-fold lower, preferably at least 10-fold, more preferably at least 50-fold, and most preferably at least 100-fold lower in the first subtype.
6. The method according to at least one of the claims 1-4, wherein the expression level of markers expressed higher in a first subtype than in at least one second subtype, which differs from the first subtype, is at least 5

%, 10% or 20%, more preferred at least 50% or may even be 75% or 100%, i.e. 2-fold higher, preferably at least 10-fold, more preferably at least 50-fold, and most preferably at least 100-fold higher in the first subtype.

- 5        7.        The method according to at least one of the claims 1-6, wherein the sample is from an individual having leukemia.
8.        The method according to at least one of the claims 1-7, wherein at least one polynucleotide is in the form of a transcribed polynucleotide, or a portion thereof.
- 10       9.        The method according to claim 8, wherein the transcribed polynucleotide is a mRNA or a cDNA.
- 15       10.       The method according to claim 8 or 9, wherein the determining of the expression level comprises hybridizing the transcribed polynucleotide to a complementary polynucleotide, or a portion thereof, under stringent hybridization conditions.
- 20       11.       The method according to at least one of the claims 1-7, wherein at least one polynucleotide is in the form of a polypeptide, or a portion thereof.
12.       The method according to claim 8, 9 or 12, wherein the determining of the expression level comprises contacting the polynucleotide or the polypeptide with a compound specifically binding to the polynucleotide or the polypeptide.
- 25       13.       The method according to claim 12, wherein the compound is an antibody, or a fragment thereof.

14. The method according to at least one of the claims 1-13, wherein the method is carried out on an array.
15. The method according to at least one of the claims 1-14, wherein the method is carried out in a robotics system.
16. The method according to at least one of the claims 1-15, wherein the method is carried out using microfluidics.
17. Use of at least one marker as defined in at least one of the claims 1-3 for the manufacturing of a diagnostic for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL.
18. The use according to claim 17 for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL in an individual having leukemia.
19. A diagnostic kit containing at least one marker as defined in at least one of the claims 1-3 for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL, in combination with suitable auxiliaries.



20. The diagnostic kit according to claim 19, wherein the kit contains a reference for the leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK),  
5 AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL.
- 10 21. The diagnostic kit according to claim 20, wherein the reference is a sample or a data bank.
22. An apparatus for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal  
15 karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL in a sample containing a reference data bank.
- 20 23. The apparatus according to claim 22, wherein the reference data bank is obtainable by comprising  
(a) compiling a gene expression profile of a patient sample by determining the expression level of at least one marker selected from the markers identifiable by their Affymetrix Identification  
25 Numbers (affy id) as defined in Tables 1, and/or 2, and  
(b) classifying the gene expression profile by means of a machine learning algorithm.
- 30 24. The apparatus according to claim 23, wherein the machine learning algorithm is selected from the group consisting of Weighted Voting, K-Nearest Neighbors, Decision Tree Induction, Support Vector Machines, and Feed-Forward Neural Networks, preferably Support Vector Machines.

25. The apparatus according to at least one of the claims 22-24, wherein the apparatus contains a control panel and/or a monitor.

5 26. A reference data bank for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, 10 normal-BM, and/or CLL obtainable by comprising

(a) compiling a gene expression profile of a patient sample by determining the expression level of at least one marker selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1, and/or 2, and

15 (b) classifying the gene expression profile by means of a machine learning algorithm.

27. The reference data bank according to claim 26, wherein the reference data bank is backed up and/or contained in a computational memory chip.